1,176,488

# PATENT SPECIFICATION

DRAWINGS ATTACHED

1,176,488

Date of Application (No. 41089/69) and filing Complete Specification: 13 Dec., 1966.

Application made in United States of America (No. 517,604) on 30 Dec., 1965.

(Divided out of No. 1,176,487.

Complete Specification Published: 1 Jan., 1970.

Index at acceptance:—H1 B(D8N, D9E, P2A. P4X)

International Classification:—H 01 m 29/02

COMPLETE SPECIFICATION

## Improvements in or relating to Electrochemical Cells

We, LEESONA CORPORATION, a Corporation organised under the laws of the State of Massachusetts, United States of America, of 333 Strawberry Field Road, Warwick State of Rhode Island, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement.

The present invention relates to metal/air or/metal/oxygen electrochemical batteries.

In accordance with the present invention there is provided a metal/air or metal/oxygen electrochemical battery which comprises a plurality of electrochemical cells having a consumable anode and an air or oxygen depolarized cathode, said plurality of cells being contained in a casing having openable and closable ports therein for permitting passage of and preventing the passage of air or oxygen to the cells.

Further in accordance with the present invention there is provided a method of operating a metal/air or metal/oxygen electrochemical battery having a plurality of electrochemical cells having consumable anodes and air or oxygen depolarized cathodes in which method the access of air or oxygen to the cells is obstructed when the battery is not in use.

The utility of metal/oxygen and metal/air batteries and their requirements, including examples of the structure of the anodes and cathodes, and preferred constructional materials are shown in for example the specification of our co-pending Patent Application No. 55795/66 (serial No. 1,176,487) which describes and claims batteries comprising a plurality of cells spaced apart by inter-cell spacers having openings therein to permit access of air to the cells, each cell comprising a metal anode located within an envelope cathode and an electrolyte located in the space between anode and cathode.

Conveniently the ports are openable and closeable by slides, preferably slides formed with apertures which are movable into and out of registration with the ports. The ports are advantageously arranged in rows and each row is provided with a slide formed with apertures which are movable simultaneously into and out of registration with the ports of the row by movement of the its slide.

In a preferred arrangement the casing is in the form of a box with a lid and the ports are provided in the side walls thereof.

When slides are provided for opening and closing the ports, each slide is preferably slidably mounted on the casing in two slideways which are mutually spaced apart in the slidable direction of the slide.

The following description in which refcrence is made to the accompanying drawing is given in order to illustrate the invention. The drawing is a perspective view of a battery in accordance with the present invention, with the casing partly broken away to show the cells.

In the drawing, reference numeral 10 is directed to the complete battery comprising casing 12 in the form of a rectangular base having a lid 11. The casing 12 contains openings 14 which permit access of air to the cells. Openings 14 can be closed when the battery is not in use by apertured slides 13 each of which is slidably mounted in two slideways 15 mutually spaced apart in the slidable direction of the slide. A number of individual cells 20 are mounted within the cell casing and separated by intercell spacers 30. The intercell spacers are highly porous to permit access of air between the individual cells and to the bi-cathodes. An end plate 18 is at one end of the cell stack, positioned away from the adjacent cell 20 by means of a different type of inter-cell spacer 30 having openings 31 to permit passage of air to the cathode. The constructional details of the spacers of both types are shown in the specification of our said Ap-

plication No. 55795/66. (Serial No. 1,176,487). Cam drives 16 and 17 hold the end plate, individual cells and intercell spacers in operable contact when in the closed position, and permit convenient removal of the several components when loosened.

WHAT WE CLAIM IS:—

1. A metal/air or metal/oxygen electrochemical battery which comprises a plurality of electrochemical cells having a consumable anode and an air or oxygen depolarized cathode, said plurality of cells being contained in a casing having openable and closeable ports therein for permitting passage of and preventing the passage of air or oxygen to the cells.

2. A battery according to claim 1 in which the ports are openable and closeable by slides.

3. A battery according to claim 1 in which ports are openable and closable by slides formed with apertures which are movable into and out of registration with the ports.

4. A battery according to claim 1 in which the ports are arranged in rows and each row is provided with a slide formed with apertures which are movable simultaneously into and out of registration with the ports of the row by movement of its slide.

5. A battery according to any one of claims 1 to 4 in which the casing is in the form of a box with a lid and the ports are provided in the side walls thereof.

6. A battery according to any one of claims 2, 3, or 4 in which each slide is slidably mounted on the casing in two slideways which are mutually spaced apart in the slidable direction of the slide.

7. A method of operating a metal/air or metal/oxygen electrochemical battery claimed in claim 1 in which method the access of air or oxygen to the cells is obstructed when the battery is not in use.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.1.
Chartered Patent Agents,
Agents for the Applicants.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1970.
Published by the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

1176488 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*